

AMENDMENTS TO THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double-bracketed text indicating deletions.

LISTING OF CLAIMS

1. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 53, wherein:

the signal section sequentially supplies to the liquid crystal panel, as the test signal, (i) a signal corresponding to an original tone, (ii) an overshoot signal, and (iii) a signal corresponding to an attainment tone in this order in test driving, while sweeping a level of the overshoot signal,

the analysis section analyzes detection results of the display detection section obtained in the test driving and storing in association with the original tone and the attainment tone, as the optimal level of the test signal, a level of the overshoot signal that corresponds to an optimum one of the detection results.

2. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, further comprising:

an optical light-receiving element provided in the display detection section; and
a waveform analysis device provided in the analysis section so as to receive an output from the optical light-receiving element,

the waveform analysis device analyzing waveforms of the output of the optical light-receiving element supplied in response to the test driving so as to obtain (i) relationship between a maximum or minimum level in each of the waveforms and a level corresponding to the attainment

tone, and (ii) a time required for attaining the level corresponding to the attainment tone, and storing in association with the original tone and the attainment tone, a level of the overshoot signal that corresponds to an optimum one of the waveforms.

3. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, further comprising:

a thermostatic chamber which contains the liquid crystal panel.

4. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, wherein:

the signal section includes switches which respectively correspond to (i) the signal corresponding to the original tone, (ii) the overshoot signal, and (iii) the signal corresponding to the attainment tone, each of the switches being digitally controlled so as to output as one of the signals (i), (ii), and (iii) a voltage according to how the each of the switches is turned ON or OFF.

5. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, wherein:

the level of the overshoot signal that the signal section supplies to the liquid crystal panel sequentially changes in accordance with tone transition from the original tone to the attainment tone; and

the analysis section sequentially stores in association with the original tone and the attainment tone, a level of the overshoot signal that corresponds to an optimum one of the detection results.

6. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 5, wherein:

the level of the overshoot signal that the signal section supplies to the liquid crystal panel is sequentially phased down in predetermined tone transition where the original tone is smaller than the attainment tone.

7. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 5, wherein:

the level of the overshoot signal that the signal section supplies to the liquid crystal panel is sequentially phased up in predetermined tone transition where the original tone is larger than the attainment tone.

8. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 5, wherein:

the level of the overshoot signal that the signal section supplies to the liquid crystal panel is unchanged during one field period.

9. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, wherein:

the signal section supplies to the liquid crystal panel an undershoot signal in accordance with tone transition from the original tone to the attainment tone, after supplying the signal corresponding to the original tone and before supplying the overshoot signal, and performs the test driving while sweeping levels of the overshoot signal and the undershoot signal; and the analysis section stores in association with the original tone and the attainment tone,

levels of the overshoot signal and the undershoot signal that correspond to an optimum one of the detection results.

10. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 9, wherein:

the level of the undershoot signal that the signal section supplies to the liquid crystal panel sequentially changes in predetermined tone transition; and

the analysis section sequentially stores in association with the original tone and the attainment tone, a level of the undershoot signal that corresponds to an optimum one of the detection results.

11. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 10, wherein:

the level of the undershoot signal that the signal section supplies to the liquid crystal panel is sequentially phased up in predetermined tone transition where the original tone is smaller than the attainment tone.

12. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 10, wherein:

the level of the undershoot signal that the signal section supplies to the liquid crystal panel is sequentially phased down in predetermined tone transition where the original tone is larger than the attainment tone.

13. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in

claim 10, wherein:

the level of the undershoot signal that the signal section supplies to the liquid crystal panel is unchanged during one field period.

14. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, further comprising:

a video signal generating circuit provided in the signal section;

an optical light-receiving element provided in the display detection section; and

a waveform analysis device provided in the analysis section so as to receive an output from the optical light-receiving element,

the video signal generating circuit sequentially supplying to the liquid crystal panel (i) the signal corresponding to the original tone, (ii) the overshoot signal with respect to each of a plurality of field periods, and (iii) the signal corresponding to the attainment tone in this order so as to perform the test driving over the plurality of field periods, while sweeping the level of the overshoot signal in each of the plurality of field periods,

the waveform analysis device analyzing waveforms of the output of the optical light-receiving element supplied in response to the test driving over the plurality of field periods so as to obtain (i) relationship between a maximum or minimum level in each of the plurality of field periods and a level corresponding to the attainment tone, and (ii) a time required for attaining the level corresponding to the attainment tone, and storing in association with the original tone and the attainment tone, a level of the overshoot signal that corresponds to an optimum one of the waveforms with respect to each of the field periods.

15. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in

claim 53, wherein

the signal section which is a video signal generating circuit sequentially supplies to the liquid crystal panel, as the test signal, (i) a signal corresponding to an original tone and (ii) an overshoot signal in test driving, while sweeping a level of the overshoot signal,

the analysis section which is a waveform analysis device analyzes waveforms of the output of the display detection section is an optical light-receiving element supplied in response to the test driving so as to obtain (i) relationship between a maximum or minimum level in each of the waveforms and a level corresponding to a desired attainment tone, and (ii) a time required for substantially attaining the level corresponding to the desired attainment tone, and storing in association with the original tone and the attainment tone, as the optimal level of the test signal, a level of the overshoot signal that corresponds to an optimum one of the waveforms in accordance with analysis results.

16. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 53, wherein

the signal section sequentially supplies to the liquid crystal panel, as the test signal, a signal corresponding to an original tone and then, in accordance with tone transition from the original tone to an attainment tone, either (i) an overshoot test signal or (ii) both an overshoot test signal and an undershoot test signal in test driving, while sweeping either a level of the signal (i) or levels of both the signals (ii),

the analysis section analyzes detection results of the display detection section obtained in the test driving and storing in association with the original tone and the attainment tone, as the optimal level of the test signal, either a level of the signal (i) or levels of both the signals (ii) that corresponds to an optimum one of the detection results.

17. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 16, further comprising:

an optical light-receiving element provided in the display detection section; and
a waveform analysis device provided in the analysis section so as to receive an output waveform from the optical light-receiving element,
the waveform analysis device analyzing output waveforms of the optical light-receiving element supplied in response to the test driving so as to obtain (i) relationship between a maximum or minimum level in each of the output waveforms and a level corresponding to the attainment tone, and (ii) a time required for attaining the level corresponding to the attainment tone, and storing in association with the original tone and the attainment tone, a level of the test signal that corresponds to an optimum one of the output waveforms.

18. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 16, wherein:

the overshoot test signal that the signal section supplies to the liquid crystal panel has a plurality of levels in predetermined tone transition; and
the analysis section stores in association with the original tone and the attainment tone, a combination of the plurality of levels in the overshoot test signal that corresponds to an optimum one of the detection results.

19. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 18, wherein:

the level of the overshoot test signal that the signal section supplies to the liquid crystal

panel is unchanged during one field period.

20. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 16, wherein:

the signal section sequentially supplies to the liquid crystal panel (i) the signal corresponding to the original tone, (ii) the undershoot test signal which has at least one level, and (iii) the overshoot test signal which has at least one level in this order in predetermined tone transition; and

the analysis section stores in association with the original tone and the attainment tone, levels of the undershoot test signal and the overshoot test signal that correspond to an optimum one of the detection results.

21. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 20, wherein:

the level of the test signal that the signal section supplies to the liquid crystal panel is unchanged during one field period.

22. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 1, wherein

the signal section which is a video signal generating circuit supplies to the liquid crystal panel, as a test signal, a video signal whose level changes from A to C, then from C to B, where A is a level corresponding to a tone before being changed, B is a level corresponding to a tone to be attained, and C is a level of an overshoot signal as the test signal (including a case where C=B), while sweeping the level of the overshoot signal C; and

the analysis section which is a waveform analysis device stores in association with the tone before being changed and the tone to be attained, as the optimal level the test signal, a level of the overshoot signal C that realizes a response waveform which reaches the tone to be attained fastest without overresponse, among response waveforms obtained while sweeping the level of the overshoot signal C.

23. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 22, wherein:

overshoot driving is performed over n field periods (n is an integer not less than 1);
the level of the video signal that the video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to C1 through Cn, then from C1 through Cn to B over the n field periods while levels of the overshoot signal C1 through Cn are being swept so as to change a combination of the levels C1 through Cn, where the levels of the overshoot signal over the n field periods are sequentially C1, C2, . . . , and Cn in this order; and

the waveform analysis device stores in association with the tone before being changed and the tone to be attained, a combination of the levels of the overshoot signals C1 through Cn that realizes a response waveform which reaches the tone to be attained fastest without overresponse, among response waveforms obtained while sweeping the levels of the overshoot signal C1 through Cn so as to change the combination of the levels C1 through Cn.

24. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 22, further comprising:

a thermostatic chamber which contains at least the liquid crystal panel.

25. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 22, wherein:

the video signal generating circuit includes switches which respectively correspond to the signal corresponding to the tone before being changed, the tone to be attained, and the level of the overshoot signal C, each of the switches being digitally controlled so as to output as the video signal a voltage according to how the each of the switches is turned ON or OFF.

26. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 25, wherein:

the switch for adjusting the level of the overshoot signal C includes two types of switches respectively for coarse adjustment and fine adjustment.

27. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

the video signal generating circuit includes switches which respectively correspond to the signal corresponding to the tone before being changed, the tone to be attained, and the levels of the overshoot signal C₁ through C_n, each of the switches being digitally controlled so as to output as the video signal a voltage according to how the each of the switches is turned ON or OFF.

28. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 27, wherein:

the switch for adjusting the levels of the overshoot signal C₁ through C_n includes two types of switches respectively for coarse adjustment and fine adjustment.

29. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in rise response where $A < B$, C_1 through C_n with respect to the tone before being changed and the tone to be attained are set to satisfy $B \leq C_1 \geq C_2 \geq \dots \geq C_n$;

a k th level of the overshoot signal C_k (k is an integer that satisfies $1 \leq k \leq n$) is set to a maximum value that does not cause a response waveform with respect to the level of the overshoot signal C_k to exceed a level of the tone to be attained; and

if the response waveform with respect to the level of the overshoot signal C_k substantially reaches the level of the tone to be attained, C_{k+1} through C_n are set to B .

30. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in decay response where $A > B$, C_1 through C_n with respect to the tone before being changed and the tone to be attained are set to $B \geq C_1 \leq C_2 \leq \dots \leq C_n$;

a k th level of the overshoot signal C_k (k is an integer that satisfies $1 \leq k \leq n$) is set to a minimum value that does not cause a response waveform with respect to the level of the overshoot signal C_k to exceed a level of the tone to be attained; and if the response waveform with respect to the level of the overshoot signal C_k substantially reaches the level of the tone to be attained, C_{k+1} through C_n are set to B .

31. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in rise response where $A < B$, C_1 through C_n with respect to the tone before being changed and the tone to be attained are set to satisfy $A \leq C_1 \leq \dots \leq C_k < B \leq C_{k+1} \geq \dots \geq C_n$ (k is an integer that

satisfies $1 \leq k \leq n$); a j th level of the overshoot signal C_j (j is an integer that satisfies $k+1 \leq j \leq n$) is set to a maximum value that does not cause a response waveform with respect to the level of the overshoot signal C_j to exceed a level of the tone to be attained; and if the response waveform with respect to the level of the overshoot signal C_j substantially reaches the level of the tone to be attained, C_{j+1} through C_n are set to B .

32. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in rise response where $A < B$, the level of the video signal that the video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to U_1 through U_n , then from U_1 through U_n to C_1 through C_n , then from C_1 through C_n to B while both U_1 through U_n and C_1 through C_n are being swept so as to change a combination of the levels C_1 through C_n and a combination of levels U_1 through U_n , where U_1 through U_n are levels of an undershoot signal which satisfy $A < U_1 \leq U_n \leq B$, and the levels of the overshoot signal C_1 through C_n satisfy $B \leq C_1$.

$\geq \dots \geq C_n$; and

the waveform analysis device determines a combination of the levels of the undershoot signal U_1 through U_n and a combination of the levels of the overshoot signal C_1 through C_j (j is an integer that satisfies $1 \leq j \leq n$) that realize a response waveform which substantially reaches a level of the tone to be attained fastest without exceeding the level of the tone to be attained, and sets C_{j+1} through C_n to B if $j \leq n-1$.

33. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in decay response where $A > B$, C_1 through C_n with respect to the tone before being changed

and the tone to be attained are set to $A > C_1 \geq \dots \geq C_k > B \geq C_{k+1} \leq \dots \leq C_n$ (k is an integer that satisfies $1 \leq k \leq n$);

a j th level of the overshoot signal C_j (j is an integer that satisfies $k+1 \leq j \leq n$) is set to a minimum value that does not cause a response waveform with respect to the level of the overshoot signal C_j to exceed a level of the tone to be attained; and

if the response waveform with respect to the level of the overshoot signal C_j substantially reaches the level of the tone to be attained, C_{j+1} through C_n are set to B .

34. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in decay response where $A > B$, the level of the video signal that the video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to U_1 through U_n , then from U_1 through U_n to C_1 through C_n , then from C_1 through C_n to B while both U_1 through U_n and C_1 through C_n are being swept so as to change a combination of the levels C_1 through C_n and a combination of levels U_1 through U_n , where U_1 through U_n are levels of an undershoot signal which satisfy $A > U_1 \geq U_n > B$, and the levels of the overshoot signal C_1 through C_n satisfy $B \geq C_1 \leq \dots \leq C_n$; and

the waveform analysis device determines a combination of the levels of the undershoot signal U_1 through U_n and a combination of the levels of the overshoot signal C_1 through C_j (j is an integer that satisfies $1 \leq j \leq n$) that realize a response waveform which substantially reaches a level of the tone to be attained fastest without exceeding the level of the tone to be attained, and sets C_{j+1} through C_n to B if $j \leq n-1$.

35. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in

claim 23, wherein:

in rise response where $A < B$, C_1 through C_n with respect to the tone before being changed and the tone to be attained are set to satisfy $B \leq C_1 = C_2 = \dots = C_n$; and

a k th level of the overshoot signal C_k (k is an integer that satisfies $1 \leq k \leq n$) is set to a maximum value that does not cause a response waveform with respect to the levels of the overshoot signal C_1 through C_n to exceed a level of the tone to be attained.

36. (WITHDRAWN) The evaluation apparatus of a liquid crystal display device as set forth in claim 23, wherein:

in decay response where $A > B$, C_1 through C_n with respect to the tone before being changed and the tone to be attained are set to $B \geq C_1 = C_2 = \dots = C_n$; and

a k th level of the overshoot signal C_k (k is an integer that satisfies $1 \leq k \leq n$) is set to a minimum value that does not cause a response waveform with respect to the levels of the overshoot signal C_1 through C_n to exceed a level of the tone to be attained.

37. (WITHDRAWN) The evaluation method of a liquid crystal display device as set forth in claim 54, wherein

in the repeatedly supplying step, supplied are to a liquid crystal panel to be evaluated, (i) a signal corresponding to an original tone, (ii) an overshoot signal, and (iii) a signal corresponding to an attainment tone; and

in the storing step, stored is, as the optimal level of the test signal, a level of the overshoot signal that corresponds to an optimum one of the analysis results in accordance with analysis results.

38. (WITHDRAWN) The evaluation method of a liquid crystal display device as set forth in claim

54, wherein

in the repeatedly supplying step, supplied are to a liquid crystal panel to be evaluated, a signal corresponding to an original tone and then, in accordance with tone transition from the original tone to an attainment tone, either (i) an overshoot test signal or (ii) both an overshoot test signal and an undershoot test signal and

in the storing step, stored is, as the optimal level of the test signal, either a level of the signal (i) or levels of both the signals (ii) that corresponds to an optimum one of analysis results.

39. (WITHDRAWN) The evaluation method of a liquid crystal display device as set forth in claim 37, wherein

the repeatedly supplying step includes the steps:

(i) supplying to the liquid crystal panel a video signal whose level changes from A to C, then from C to B, where A is a level corresponding to a tone before being changed, B is a level corresponding to a tone to be attained, and C is a level of the overshoot signal as the test signal (including a case where C=B);

(ii) sensing a display image of the liquid crystal panel that is displayed in accordance with the video signal; and

(iii) analyzing a waveform of the sensed display image, and

(iv) in the storing step, stored is, as the optimal level of the test signal, a level of the overshoot signal C that realizes a response waveform which reaches the tone to be attained fastest without overresponse, among response waveforms with respect to the level of the overshoot signal C,

the steps (i) through (iii) being repeated while sweeping the level of the overshoot signal C.

40. (WITHDRAWN) The evaluation method of a liquid crystal display device as set forth in claim 39, comprising the steps of:

the level of the video signal that a video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to C₁ through C_n, then from C₁ through C_n to B over n field periods (n is an integer not less than 1) while levels of the overshoot signal C₁ through C_n are being swept so as to change a combination of the levels C₁ through C_n, where the levels of the overshoot signal over the n field periods are sequentially C₁, C₂, . . . , and C_n in this order, overshoot driving being performed over the n field periods.

41. (WITHDRAWN-CURRENTLY AMENDED) The liquid crystal display device as set forth in claim 56, wherein:

the drive circuit stores an optimum level of an overshoot signal as a Look-up Table; and the optimum level of the overshoot signal is obtained by an evaluation method that has the steps of repeatedly supplying to the liquid crystal panel, (i) a signal corresponding to an original tone, (ii) an overshoot signal, and (iii) a signal corresponding to an attainment tone sequentially in this order while sweeping a level of the overshoot signal, so as to analyze display results of the liquid crystal panel; and in accordance with analysis results, determining the optimum level of the overshoot signal in association with the original tone and the attainment tone.

42. (CANCELLED)

43. (CURRENTLY AMENDED) The liquid crystal display device as set forth in claim[[42]] 56, wherein:

the drive circuit stores as a Look-up Table an optimum combination of a plurality of levels

of the overshoot signal in predetermined tone transition; and

the optimum combination is set to a combination of levels of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone and then the overshoot test signal having a plurality of levels while sweeping the levels of the overshoot test signal, so as to analyze the display results of the liquid crystal panel.

44. (CURRENTLY AMENDED) The liquid crystal display device as set forth in claim[[42]]

56, wherein:

the drive circuit stores as a Look-up Table an optimum combination of a level of the overshoot signal and a level of an undershoot signal in predetermined tone transition; and

the optimum combination is set to a combination of a level of the undershoot test signal and a level of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone, the undershoot test signal, and the overshoot test signal sequentially in this order while sweeping the levels of the undershoot and overshoot test signals, so as to analyze the display results of the liquid crystal panel.

45. (CANCELLED)

46. (CURRENTLY AMENDED) The liquid crystal display device as set forth in claim[[42]]

56, wherein:

the Look-up Table is stored with respect to each of a plurality of temperatures.

47. (WITHDRAWN) The liquid crystal display device as set forth in claim 59, wherein in the drive circuit an overshoot signal C as the test signal is stored as the Look-up Table, wherein

the signal section which is a video signal generating circuit supplies to the liquid crystal panel a video signal whose level changes from A to C, then from C to B, where A is a level corresponding to a tone before being changed, B is a level corresponding to a tone to be attained, and C is a level of an overshoot signal as the test signal (including a case where C=B), while sweeping the level of the overshoot signal C; and

the analysis section which is a waveform analysis device stores in association with the tone before being changed and the tone to be attained, as the optimal level of the test signal, a level of the overshoot signal C that realizes a response waveform which reaches the tone to be attained fastest without overresponse, among response waveforms obtained while sweeping the level of the overshoot signal C.

48. (WITHDRAWN) The liquid crystal display device as set forth in claim 47, wherein:

the drive circuit further stores levels of the overshoot signal C₁ through C_n as a Look-up Table for overshoot driving;

the level of the video signal that the video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to C₁ through C_n, then from C₁ through C_n to B over n field periods (n is an integer not less than 1) while the levels of the overshoot signal C₁ through C_n are being swept so as to change a combination of the levels C₁ through C_n, where the levels of the overshoot signal over the n field periods are sequentially C₁, C₂, . . . , and C_n in this order; and

the waveform analysis device stores in association with the tone before being changed and the tone to be attained, levels of the overshoot signals C₁ through C_n that realize a response waveform which reaches the tone to be attained fastest without overresponse, among response

waveforms obtained while sweeping the levels of the overshoot signal C1 through Cn.

49. (WITHDRAWN) The liquid crystal display device as set forth in claim 48, wherein:
- the drive circuit further stores levels of the overshoot signal C1 through Cn and levels of an undershoot signal U1 through Un as a Look-up Table for overshoot driving;
- in rise response where A<B, the level of the video signal that the video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to U1 through Un, then from U1 through Un to C1 through Cn, then from C1 through Cn to B while both U1 through Un and C1 through Cn are being swept so as to change a combination of the levels C1 through Cn and a combination of levels U1 through Un, where U1 through Un are levels of the undershoot signal which satisfy $A < U_1 \leq \dots \leq U_n \leq B$, and the levels of the overshoot signal C1 through Cn satisfy $B \leq C_1 \geq \dots \geq C_n$; and
- the waveform analysis device determines a combination of the levels of the undershoot signal U1 through Un and a combination of the levels of the overshoot signal C1 through Cj (j is an integer that satisfies $1 \leq j \leq n$) that realize a response waveform which substantially reaches a level of the tone to be attained fastest without exceeding the level of the tone to be attained, and sets Cj+1 through Cn to B if $j \leq n-1$.
50. (WITHDRAWN) The liquid crystal display device as set forth in claim 48, wherein:
- the drive circuit further stores levels of the overshoot signal C1 through Cn and levels of an undershoot signal U1 through Un as a Look-up Table for overshoot driving;
- in decay response where A>B, the level of the video signal that the video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to U1 through Un, then from U1 through Un to C1 through Cn, then from C1 through Cn to B while both U1 through Un and C1

through C_n are being swept so as to change a combination of the levels C₁ through C_n and a combination of levels U₁ through U_n, where U₁ through U_n are levels of the undershoot signal which satisfy A>U₁.gtoreq.gtoreq.U_n>B, and the levels of the overshoot signal C₁ through C_n satisfy B≥C₁≤...≤C_n; and

the waveform analysis device determines a combination of the levels of the undershoot signal U₁ through U_n and a combination of the levels of the overshoot signal C₁ through C_j (j is an integer that satisfies 1≤j≤n) that realize a response waveform which substantially reaches a level of the tone to be attained fastest without exceeding the level of the tone to be attained, and sets C_{j+1} through C_n to B if j≤n-1.

51. (WITHDRAWN) The liquid crystal display device as set forth in claim 60, in which a level of an overshoot signal C as a test signal is stored as the Look-up Table in the drive circuit, wherein:

the level of the overshoot signal C is evaluated by a method which supplies an overshoot signal to a liquid crystal panel to be evaluated so as to evaluate an optimum level of an overshoot signal in accordance with a response result,

the method comprising the steps of:

(i) supplying to the liquid crystal panel a video signal whose level changes from A to C, then from C to B, where A is a level corresponding to a tone before being changed, B is a level corresponding to a tone to be attained, and C is a level of the overshoot signal (including a case where C=B);

(ii) sensing a display image of the liquid crystal panel that is displayed in accordance with the video signal;

(iii) analyzing a waveform of the sensed display image; and

(iv) storing in association with the tone before being changed and the tone to be attained, as

the optimal level of the test signal, a level of the overshoot signal C that realizes a response waveform which reaches the tone to be attained fastest without overresponse, among response waveforms with respect to the level of the overshoot signal C,
the steps (i) through (iii) being repeated while sweeping the level of the overshoot signal C.

52. (WITHDRAWN) The liquid crystal display device as set forth in claim 51, wherein:
the drive circuit further stores levels of the overshoot signal C1 through Cn and levels of an undershoot signal U1 through Un as a Look-up Table for overshoot driving;
the level of the video signal that a video signal generating circuit supplies to the liquid crystal panel sequentially changes from A to C1 through Cn, then from C1 through Cn to B over n field periods (n is an integer not less than 1) while levels of the overshoot signal C1 through Cn are being swept so as to change a combination of the levels C1 through Cn, where the levels of the overshoot signal over the n field periods are sequentially C1, C2, . . . , and Cn in this order,
overshoot driving being performed over the n field periods.

53. (WITHDRAWN) An evaluation apparatus of a liquid crystal display device, comprising:
a signal section for supplying a signal to a liquid crystal panel to be evaluated;
a display detection section for sensing a display state of the liquid crystal panel; and
an analysis section for analyzing a detection result of the display section,
the signal section sequentially supplying to the liquid crystal panel (i) a signal corresponding to an original tone, and (ii) a test signal consisting of either only an overshoot signal or both an overshoot signal and an undershoot signal in this order in test driving, while sweeping a level of the test signal,

the analysis section analyzing detection results of the display detection section obtained in the test driving and storing in association with the original tone and the attainment tone, an optimal level of the test signal.

54. (WITHDRAWN) An evaluation method of a liquid crystal display device, comprising the steps of:

repeatedly supplying to a liquid crystal panel to be evaluated, (i) a signal corresponding to an original tone, and (ii) a test signal consisting of either only an overshoot signal or both an overshoot signal and an undershoot signal sequentially in this order while sweeping a level of the test signal, so as to analyze display results of the liquid crystal panel; and

storing in association with the original tone and the attainment tone an optimal level of the test signal.

55. (WITHDRAWN) The evaluation method of a liquid crystal display device as set forth in claim 54, wherein:

in the repeatedly supplying step, supplied are to a liquid crystal panel to be evaluated, (i) a signal corresponding to an original tone and (ii) an overshoot signal; and

in the storing step, analyzed are waveforms of the output of a display image of the liquid crystal panel so as to obtain (i) relationship between a maximum or minimum level in each of the waveforms and a level corresponding to a desired attainment tone, and (ii) a time required for substantially attaining the level corresponding to the desired attainment tone, and storing in association with the original tone and the attainment tone, as the optimal level of the test signal, a level of the overshoot signal that corresponds to an optimum one of the waveforms in accordance with analysis results.

56. (CURRENTLY AMENDED) A liquid crystal display device which includes a liquid crystal panel and a drive circuit, wherein:

the drive circuit stores as a Look-up Table an optimum level of a test signal consisting of either only an overshoot signal or both an overshoot signal and an undershoot signal in accordance with tone transition from an original tone to an attainment tone; and

the optimum level is set to a level of the test signal that corresponds to an optimum one of display results, which of the signal is obtained by an evaluation method that has the steps of repeatedly supplying to the liquid crystal panel, (i) a signal corresponding to an original tone and then, in accordance with tone transition, (ii) the test signal, that is either only the overshoot signal or both the overshoot signal and the undershoot signal, and (iii) a signal corresponding to an attainment tone sequentially in this order while sweeping a level of the test signal, so as to analyze display results of the liquid crystal panel; and in accordance with analysis results, determining the optimum level of the test signal in association with the original tone and the attainment tone,

wherein the optimum one of the display results is a display result of the display results where the attainment tone is substantially displayed faster than a remainder of the display results without exceeding the attainment tone.

57. (WITHDRAWN-CURRENTLY AMENDED) The liquid crystal display device as set forth in claim 41, wherein:

the drive circuit supplies to the liquid crystal panel a video signal whose level changes from A to C, then from C to B, where A is a level corresponding to a tone before being changed, B is a level corresponding to a tone to be attained, and C is a level of an overshoot signal (including a case where C = B), while sweeping the level of the overshoot signal C; and

in the Look-up Table, stored is, in association with the tone before being changed and the tone to be attained, a level of the overshoot signal C that realizes a response waveform which reaches the tone to be attained fastest without overresponse, among response waveforms obtained while sweeping the level of the overshoot signal C.

58. (WITHDRAWN) The liquid crystal display device as set forth in claim 56, wherein:
the drive circuit stores an optimum level of an overshoot signal as a Look-up Table; and
in the Look-Up Table, analyzed are waveforms of the output of a display image of the liquid crystal panel so as to obtain (i) relationship between a maximum or minimum level in each of the waveforms and a level corresponding to a desired attainment tone, and (ii) a time required for substantially attaining the level corresponding to the desired attainment tone, and stored is, in association with the original tone and the attainment tone, as the optimal level of the test signal, a level of the overshoot signal that corresponds to an optimum one of the waveforms in accordance with analysis results.

59. (WITHDRAWN) A liquid crystal display device which includes a liquid crystal panel, a drive circuit in which a level of a test signal C consisting of either only an overshoot signal or both an overshoot signal and an undershoot signal is stored as a Look-Up Table for test driving, and an evaluation apparatus for determining the level of the test signal C,
the evaluation apparatus comprising:
a signal section for supplying a signal to a liquid crystal panel to be evaluated;
a display detection section for sensing a display state of the liquid crystal panel; and
an analysis section for analyzing a detection result of the display detection section,
the signal section sequentially supplying to the liquid crystal panel (i) a signal corresponding

to an original tone, and (ii) the test signal in this order in test driving, while sweeping a level of the test signal,

the analysis section analyzing detection results of the display detection section obtained in the test driving and storing in association with the original tone and the attainment tone, an optimal level of the test signal.

60. (WITHDRAWN) A liquid crystal display device which includes a liquid crystal panel, and a drive circuit in which a level of a test signal C consisting of either only an overshoot signal or both an overshoot and an undershoot signal is stored as a Look-Up Table for test driving, wherein:

the level of the test signal C is evaluated by a method which supplies a test signal to a liquid crystal panel to be evaluated so as to evaluate an optimum level of a test signal in accordance with a response result,

the method comprising the steps of:

repeatedly supplying to a liquid crystal panel to be evaluated, (i) a signal corresponding to an original tone, and (ii) the test signal sequentially in this order while sweeping a level of the test signal, so as to analyze display results of the liquid crystal panel; and

storing in association with the original tone and the attainment tone, an optimal level of the test signal.

61. (New) A liquid crystal display device which includes a liquid crystal panel and a drive circuit, wherein:

the drive circuit stores as a Look-up Table an optimum level of a test signal consisting of either only an overshoot signal or both an overshoot signal and an undershoot signal in accordance with tone transition from an original tone to an attainment tone; and

the optimum level of the test signal is obtained by an evaluation method that has the steps of repeatedly supplying to the liquid crystal panel, (i) a signal corresponding to an original tone, (ii) the test signal, and (iii) a signal corresponding to an attainment tone sequentially in this order while sweeping a level of the test signal, wherein the level of the test signal at each trial of the sweeping is selected and tested in turn from a plurality of predetermined levels and without calculation of an ideal optimum level of the test signal, so as to analyze display results of the liquid crystal panel; and in accordance with analysis results, determining the optimum level of the test signal in association with the original tone and the attainment tone.

62. (New) The crystal display device as set forth in claim 61, wherein the level of the test signal at each trial of sweeping is selected and tested in turn from a plurality of predetermined levels without calculation of a predicted value of an ideal optimum level of the test signal based on the original tone or the attainment tone, and regardless of the predicted value.

63. (New) The liquid crystal display device as set forth in claim 62, wherein the level of the test signal at each trial of the sweeping is selected and tested in turn from the plurality of predetermined levels which satisfy a rule that the level is equal to or more than a level which corresponds to the attainment tone in case of overshoot and is equal to or less than a level which corresponds to the attainment tone in case of undershoot.

64. (New) The liquid crystal display device as set forth in claim 61, wherein:
the drive circuit stores as a Look-up Table an optimum combination of a plurality of levels of the overshoot signal in predetermined tone transition; and
the optimum combination is set to a combination of levels of the overshoot test signal that

corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone and then the overshoot test signal having a plurality of levels while sweeping the levels of the overshoot test signal, so as to analyze the display results of the liquid crystal panel.

65. (NEW) The liquid crystal display device as set forth in claim 61, wherein:

the drive circuit stores as a Look-up Table an optimum combination of a level of the overshoot signal and a level of an undershoot signal in predetermined tone transition; and
the optimum combination is set to a combination of a level of the undershoot test signal and a level of the overshoot test signal that corresponds to an optimum one of display results, which is obtained by repeatedly supplying to the liquid crystal panel, a signal corresponding to the original tone, the undershoot test signal, and the overshoot test signal sequentially in this order while sweeping the levels of the undershoot and overshoot test signals, so as to analyze the display results of the liquid crystal panel.

66. (NEW) The liquid crystal display device as set forth in claim 61, wherein the optimum level is set to a level of the test signal that corresponds to an optimum one of display results and the optimum one of the display results is a display result of the display results where the attainment tone is substantially displayed faster than a remainder of the display results without exceeding the attainment tone.

67. (New) The liquid crystal display device as set forth in claim 61, wherein:

the Look-up Table is stored with respect to each of a plurality of temperatures.